REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1, 3, 11, 18, 20, 22, and 40-43 are presently active. Claims 2, 4-10, 12-17, 19, 21, and 23-39 are withdrawn. Claims 27-39 have been canceled without prejudice. Claims 44- have been added. Claims 41 and 43 have been presently amended. Claims 44-45 have been added. No new matter was added.

In the Office Action, Claims 1, 3, 11, 18, 20, 22, and 40-43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,556,500 to Hasegawa et al in view of Kumar et al.

Applicants acknowledge with appreciation the courtesy of Examiner Arancibia to discuss this case briefly with Applicants' representatives on April 20, 2008 during which time Applicants' arguments about teaching away were discussed as substantially summarized and supplemented hereinafter.

Claim 1 as previously presented recited:

> 1. A processing element for a semiconductor manufacturing system, said processing element comprising:
> a cylindrical unit including a passive polymeric component and an active component;
> said cylindrical unit having a first radially-extending surface and a second radially extending surface opposite the first radially-extending surface, wherein an inside diameter of the cylindrical unit forms an opening for disposition of the cylindrical unit around a substrate position in the semiconductor manufacturing system and the second radially extending surface is a substantially planar surface for disposition on a substrate holder in the semiconductor manufacturing system;
> said passive polymeric component configured to erode when exposed to a plasma process in said semiconductor manufacturing system; and
> said active component included as a part of said passive component and configured to alter the chemistry of the processing when exposed to the plasma process.

The Office Action takes a position that:

> Kumar et al. teaches a processing element for a plasma processing system (Column 3, Lines 18-20), comprising: a passive polymeric component (a passive plasma catalyst.. .capable of inducing a plasma by deforming a local electric field, Column 9, Lines 2-1 1, which can be an electrically conductive polymer or a polymer nanocomposite, Column 10, Lines 3-8) that can have various shapes including that of a cylindrical ring (annular; Column 10, Lines 50-53) and is configured to erode when exposed to a plasma process in the plasma processing system (it is consumed by the plasma; ex. Column 11, Lines 37-43); and an active component included as a part of said passive component and configured to alter the chemistry of the processing when exposed to the plasma process (an additive [that] can include any material that a user wishes to add to the plasma, such as a dopant or a precursor material that, upon decomposition, can form the dopant; Column 11, Lines 1-17). Kumar et al. teaches that the active component can comprise a distribution of solid particles (the additive) encapsulated within the passive component (the passive plasma catalyst). (Column 11 , Lines 1-54; Figure 3).
>
> In regards to Claims 1, 3, 1, 18, 20, 22, 40, and 42, it would have been obvious to one of ordinary skill in the art to modify the embodiment of either Figure 1 or Figure 8 of Hasegawa et al. to substitute a cylindrical ring-shaped element comprising a passive polymeric component, and an active component comprising a distribution of solid particles encapsulated within the passive component, the active component configured to alter the chemistry of the processing when exposed to the plasma process, as taught by Kumar et al., for any of the cylindrical ring-shaped elements 104 and/or 106 of Figure 1, or the entire cylindrical ring-shaped element 102 formed by elements 104 and 106, and/or the cylindrical ring-shaped element 208d of Figure 8 of Hasegawa et al. The motivation for making such a modification, as taught by Kumar et al. (see at least Column 11, Lines 1 -54), would have been to allow for the delivery of any desirable additive that a user wishes to add to the plasma, including a plasma catalyst or dopant.

However, Hasegawa et al ***teach away*** from such an alteration of their focus ring, and such an alteration of Hasegawa et al would **render the art unsatisfactory for its intended purpose**.

Firstly, Hasegawa et al clearly states at col. 1, lines 25-33, that:

> A focus ring (electric field compensating ring) is provided to surround the wafer on the lower electrode, thereby to effectively direct the reactive ions

> onto the wafer. It is necessary that the focus ring have anti-corrosion properties ***(anti-chemical properties with high resistance to etching gas)***, anti-plasma properties, heat resistance and electrical conductivity. From this standpoint, a ring formed integrally of amorphous carbon is generally used as a focus ring.
>
> Meanwhile, the claimed invention sets forth:
>
> a cylindrical unit including a passive polymeric component and an active component, with the polymeric component configured to erode when exposed to a plasma process in said semiconductor manufacturing system.

Thus, the polymeric, erodible properties of the claimed cylindrical unit are the opposite of the electrical conductivity, resistant to etching gas properties of the focus ring(s) in Hasegawa et al. The Examiner pointed out (during the discussions noted above) that this teaching in Hasegawa et al is part of their background teaching. Nevertheless, as detailed below, the focus ring structures in the embodiments of Hasegawa et al also contain many if not all of these attributes. For example, focus ring structures in the embodiments of Hasegawa et al are either made of carbon or tungsten, both of which would have a high resistance to etching gas, would be heat resistant, and would be electrically conductive, and all of which would not be possible with an erodable polymeric component.

Thus, Hasegawa et al ***teach away*** from the claimed invention.

Secondly, while Hasegawa et al may use materials for the focus ring which are made of materials similar to that being etched on the wafers (see TABLE 1 of Hasegawa et al), the purpose of such materials is not to promote for example tungsten etching of a tungsten focus ring. The Examiner will appreciate that any tungsten etching of a tungsten focus ring would take away reactive species which would otherwise be available to etch tungsten lines on the wafers. Indeed, the "SAMPLE 2" results in Hasegawa et al's Figure 5 (for a single focus ring made entirely of tungsten) shows a reduction in the etching rate toward the periphery of the wafer, which contrasts with the wafer etching rate when the single focus ring is made entirely

of amorphous carbon (i.e., "SAMPLE 1"). Thus, Hasegawa et al teach away from having a focus ring which would readily erode, thus readily consuming the reactive species which otherwise would etch the intended tungsten lines on the wafers.

Indeed, one of Hasegawa et al's solutions is to use a two part focus ring 102 with an inner part made of carbon and an outer part made of tungsten to mitigate depletion of the reactive tungsten species. Another of Hasegawa et al's solutions is to use a single focus ring 208d made of amorphous carbon, shown in Figure 8 spaced somewhat apart from the wafer. Both these solutions appear (as in Figure 5) are directed to improving the etching uniformity across the wafer surface.

Yet, modifying the focus ring of Hasegawa et al, as suggested in the Office Action, to produce an erodible focus ring, would deplete plasma species and distort the wafer etching profile, which Hasegawa et al's construction intends to make uniform. Hence, modifying the focus ring of Hasegawa et al, as suggested in the Office Action, would render Hasegawa et al unsatisfactory for its intended purpose. Under M.P.E.P. § 2143.01 V, this is also an indicia of non-obviousness.

Non-obviousness of the Independent Claims: M.P.E.P. § 2142 indicates:

> The ultimate determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). The legal standard of "a preponderance of evidence" requires the evidence to be more convincing than the evidence which is offered in opposition to it. With regard to rejections under 35 U.S.C. 103, ***the examiner must provide evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a prima facie case of obviousness) is more probable than not.***

Here , as a whole, Hasegawa et al do not disclose or suggest the claimed polymeric, erodible cylindrical unit. Indeed, the arguments above show that Hasegawa et al teach away

from the attributes of an erodible polymeric focus ring. Moreover, modifying the focus ring of Hasegawa et al to make their focus ring erodible would deplete the gas phase species, rendering Hasegawa et al unsatisfactory for its intended purpose of uniform etching.

Thus, Claims 1 and 18 (and the claims dependent therefrom) patentably define over the applied art.

Should the examiner disagree with this position on non-obviousness, Applicants would appreciate a detailed explanation as to 1) why the Examiner believes that a polymeric erodible focus ring meets the requirements in Hasegawa et al that a focus ring have a high resistance to etching gas, be heat resistant, and be electrically conductiveand 2) why the Examiner believes that an erodible focus ring would not deplete the gas phase species and defeat the purpose of the providing uniform etching in Hasegawa et al.

Dependent Claims:

Claims 41 and 43 have been amended to clarify that the passive polymeric component comprises a surface exposed to the plasma process, prior to surface exposure to the plasma process, having a greater area than an opposite surface in contact with a substrate holder surface. See Applicants' Figure 7D. The Office Action appears to have taken a position that the claim element of a surface exposed to the plasma process having a greater area than an opposite surface in contact with a substrate holder surface was met inherently when the exposed side of a focus ring was etched. This position is overcome by the present amendment to Claims 41 and 43.

Thus, dependent Claims 41 and 43 on their own merits define over the art of record.

Added Claims 44 and 45 recite that the passive polymeric component comprises an insulating material. Support for this feature is found in the list of insulating materials found in numbered paragraph [0050] of Applicants' specification including materials such as for

example Kapton, polyimide, Teflon, sol-gel, ceramic, or glass. As noted above, Hasegawa et al teach a focus ring made of a material having electrical conductivity. Indeed, the materials described in Hasegawa et al for their focus rings are materials known to have electrical conductivity. If the materials described in Hasegawa et al for their focus rings were modified to be insulating materials, then the focus rings in Hasegawa et al would not effectively direct the reactive ions onto the wafer, as prescribed in Hasegawa et al.

Thus, dependent Claims 44 and 45 on their own merits define over the art of record.

In light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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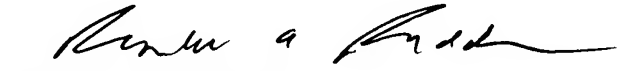

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